Amendments to the Claims

1.-10. (Canceled)

11. (New) A method for predicting a deformation in a body having surroundings, comprising the steps of:

specifying a sum of external forces ($\mathbf{f}_{ext}$) exerted on the body by the surroundings;

specifying a sum of system forces ($\mathbf{m}_{syst}$) exerted by the body on the surroundings;

specifying material properties of the body;

specifying boundary conditions acting at the interface between the body and the surroundings; and,

predicting the deformation of the body according to the formula:

$$\mathbf{f}_{ext} + \mathbf{m}_{syst} + \mathbf{m}_A + \mathbf{f}_{s(ext)} + \mathbf{m}_{s(syst)} = 0;$$

wherein: $\mathbf{m}_A$ represents surface-bonding constraining forces, $\mathbf{f}_{s(ext)}$ represents the shear component of $\mathbf{f}_{ext}$, and $\mathbf{m}_{s(syst)}$ represents the shear component of $\mathbf{m}_{syst}$.

12. (New) The method of claim 11, further comprising specifying the geometry of the body without using a plurality of nodes defining a grid.

13. (New) The method of claim 11, wherein the material properties vary as a function of location within the body.

14. (New) The method of claim 11, wherein the body and the surroundings comprise different materials.

15. (New) The method of claim 11, wherein the body and the surroundings comprise identical materials.

16. (New) The method of claim 11, wherein the step of predicting the deformation comprises computing a crack potential as a function of location within the body to identify regions within the body susceptible to deformation.

17. (New) The method of claim 11, wherein the step of predicting the deformation comprises computing radial elongations and/or radial contractions within the body to identify volumetric deformation.

18. (New) A computer, comprising a calculation means for predicting a deformation in a body according to the method of claim 1.